WEST Search History

DATE: Monday, March 31, 2003

Set Name side by side	Query	Hit Count	Set Name result set
DB=USPT,PGPB,JPAB,EPAB,DWPI,TDBD; PLUR=YES; OP=ADJ			
L25	L24 not l4	94	L25
L24	L23 not l21	94	L24
L23	L22 not l6	94	L23
L22	l1 and l5	114	L22
L21	l4 not l6	16	L21
DB=USPT; PLUR=YES; OP=ADJ			
L20	4853202.pn.	1	L20
L19	5015453.pn.	1	L19
L18	4156646.pn.	1	L18
L17	5177045.pn.	1	L17
L16	5352644.pn.	1	L16
L15	3296123.pn.	1	L15
L14	4138336.pn.	1	L14
L13	4400305.pn.	1	L13
L12	5128291.pn.	1	L12
L11	5200378.pn.	1	L11
L10	5298166.pn.	1	L10
L9	5397476.pn.	1	L9
L8	5407889.pn.	1	L8
L7	5702610.pn.	1	L7
DB=USPT,PGPB,JPAB,EPAB,DWPI,TDBD; PLUR=YES; OP=ADJ			
L6	l4 and L5	20	L6
L5	strontium or sr	162678	L5
L4	l1 and L3	36	L4
L3	rubidium or rb	47732	L3
L2	((423/$)!.CCLS.) and L1	50	L2
L1	sodium adj titanate or sodium adj nonatitanate	303	L1

END OF SEARCH HISTORY

```
=> d his

     (FILE 'HOME' ENTERED AT 12:38:17 ON 30 MAR 2003)

     FILE 'REGISTRY' ENTERED AT 12:38:31 ON 30 MAR 2003
                E SODIUM NONATITANATE/CN

     FILE 'CAPLUS' ENTERED AT 12:39:02 ON 30 MAR 2003
L1            12 S SODIUM NONATITANATE
                 S 111591-44-7/REG#

     FILE 'REGISTRY' ENTERED AT 12:55:51 ON 30 MAR 2003
L2             1 S 111591-44-7/RN

     FILE 'CAPLUS' ENTERED AT 12:55:51 ON 30 MAR 2003
L3            13 S L2
                 S 14391-63-0/REG#

     FILE 'REGISTRY' ENTERED AT 12:56:33 ON 30 MAR 2003
L4             1 S 14391-63-0/RN

     FILE 'CAPLUS' ENTERED AT 12:56:33 ON 30 MAR 2003
L5           271 S L4
                 S 14809-50-8/REG#

     FILE 'REGISTRY' ENTERED AT 12:56:52 ON 30 MAR 2003
L6             1 S 14809-50-8/RN

     FILE 'CAPLUS' ENTERED AT 12:56:52 ON 30 MAR 2003
L7           236 S L6
L8             1 S L7 AND L3

=>
```

```
L1   ANSWER 1 OF 12  CAPLUS  COPYRIGHT 2003 ACS
AN   2003:133786  CAPLUS
DN   138:158770
TI   Rubidium-82 generator based on sodium nonatitanate
     support, and improved separation methods for the recovery of strontium-82
     from irradiated targets
IN   Sylvester, Paul
PA   USA
SO   U.S. Pat. Appl. Publ., 12 pp.
     CODEN: USXXCO
DT   Patent
LA   English
IC   ICM  A61K051-00
NCL  424001110
CC   63-5 (Pharmaceuticals)
     Section cross-reference(s): 8, 71
FAN.CNT 1
     PATENT NO.        KIND  DATE           APPLICATION NO.  DATE
     ---------------   ----  --------       ---------------  --------
PI   US 2003035772      A1   20030220       US 2001-922353   20010802
PRAI US 2001-922353          20010802
AB   Sodium nonatitanate compns., a method using the compn.
     for recovery of 82Sr from irradiated targets, and a method using the
     compn. for generating 82Rb.  The sodium nonatitanate
     materials of the invention are highly selective at sepg. strontium from
     solns. derived from the dissoln. of irradiated target materials, thus
     reducing target processing times.  The compns. also have a very low
     affinity for rubidium, making it an ideal material for use as a 82Rb
     generator.  The 82Rb is eluted from the sodium
     nonatitanate support using a saline soln.  Sodium
     nonatitanate materials of this type both improve the recovery of
     82Sr and provide a safer, more effective 82Rb generator system for medical
     applications such as PET.
ST   rubidium 82 generator nonatitanate support strontium recovery
IT   Positron-emission tomography
     Radiopharmaceuticals
        (rubidium-82 generator based on sodium nonatitanate
        support, and improved sepn. methods for recovery of strontium-82 from
        irradiated targets)
IT   14391-63-0P, Rubidium 82, biological studies
     RL: DGN (Diagnostic use); SPN (Synthetic preparation); BIOL (Biological
     study); PREP (Preparation); USES (Uses)
        (rubidium-82 generator based on sodium nonatitanate
        support, and improved sepn. methods for recovery of strontium-82 from
        irradiated targets)
IT   111591-44-7P, Sodium titanate (Na4Ti9O20)
     RL: NUU (Other use, unclassified); SPN (Synthetic preparation); PREP
     (Preparation); USES (Uses)
        (rubidium-82 generator based on sodium nonatitanate
        support, and improved sepn. methods for recovery of strontium-82 from
        irradiated targets)
IT   14809-50-8P, Strontium 82, preparation
     RL: PUR (Purification or recovery); PREP (Preparation)
        (rubidium-82 generator based on sodium nonatitanate
        support, and improved sepn. methods for recovery of strontium-82 from
        irradiated targets)
IT   546-68-9, Titanium isopropoxide   1310-73-2, Sodium hydroxide, reactions
     RL: RCT (Reactant); RACT (Reactant or reagent)
        (rubidium-82 generator based on sodium nonatitanate
        support, and improved sepn. methods for recovery of strontium-82 from
        irradiated targets)
```

L1 ANSWER 3 OF 12 CAPLUS COPYRIGHT 2003 ACS
AN 1999:625570 CAPLUS
DN 131:292395
TI The removal of strontium from simulated Hanford tank wastes containing complexants
AU Sylvester, Paul; Clearfield, Abraham
CS Department of Chemistry, Texas A and M University, College Station, TX, 77842-3012, USA
SO Separation Science and Technology (1999), 34(13), 2539-2551
CODEN: SSTEDS; ISSN: 0149-6395
PB Marcel Dekker, Inc.
DT Journal
LA English
CC 71-11 (Nuclear Technology)
AB Two inorg. ion-exchange materials, a **sodium nonatitanate** and a sodium titanosilicate, were evaluated for the removal of strontium from two simulated Hanford tank wastes, both of which contained substantial amts. of complexing agents. In simulant 101-SY, both exchangers gave distribution coeffs. (Kds) <220 mL/g at a vol.-to-mass ratio of 200. However, in a second simulant, 107-AN, the titanosilicate gave a Kd of 2240 mL/g while the nonatitanate gave a similar Kd to the value obtained in the 101-SY simulant. The reason for the difference in behavior was detd. to be the concn. of calcium in the waste simulants. A high calcium concn. (as found in 107-AN) resulted in strontium, previously chelated by EDTA and other complexants, being released into soln. and absorbed by the titanosilicate. Consequently, by adding sufficient calcium to 101-SY simulant to sat. the EDTA present, it proved possible to improve the strontium Kds for the titanosilicate from 215 mL/g to in excess of 8000 mL/g. The titanate exhibited a high selectivity for calcium in comparison to the titanosilicate, and thus the high concns. of calcium in the waste simulants competed with the strontium ions for the available ion-exchange sites and resulted in low Sr Kds. As expected, Kds for the titanate showed little improvement, and the addn. of calcium only resulted in a modest increase from 185 to 395 mL/g. Waste generation is minimal, so the addn. of calcium to the tank wastes to facilitate the removal of strontium by ion exchange is an economical approach to the remediation of complexant-bearing Hanford tank wastes.
ST radioactive waste Hanford tank strontium removal; complexant Hanford tank radioactive waste strontium removal
IT High-level radioactive wastes
(liq.; removal of strontium from simulated Hanford tank wastes contg. complexants)
IT Cation exchangers
Complexing agents
Partition
(removal of strontium from simulated Hanford tank wastes contg. complexants)
IT 7631-99-4, Sodium nitrate, uses
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(removal of strontium from simulated Hanford tank wastes contg. complexants)
IT 60-00-4, EDTA, processes 77-92-9, processes 79-14-1, processes
139-13-9 142-73-4 150-39-0, HEDTA 526-95-4, D-Gluconic acid
7440-70-2, Calcium, processes 13477-34-4, Calcium nitrate tetrahydrate
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(removal of strontium from simulated Hanford tank wastes contg. complexants)
IT 7440-24-6, Strontium, processes
RL: PEP (Physical, engineering or chemical process); REM (Removal or disposal); PROC (Process)
(removal of strontium from simulated Hanford tank wastes contg.

complexants)
IT 117314-20-2 159076-88-7
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(removal of strontium from simulated Hanford tank wastes contg. complexants)
RE.CNT 17 THERE ARE 17 CITED REFERENCES AVAILABLE FOR THIS RECORD
RE
(1) Ahearne, J; Phys Today 1997, V50, P32
(2) Anon; Personal Communication from M Johnson BNFL Inc
(3) Behrens, E; Environ Sci Technol 1998, V32, P101 CAPLUS
(4) Behrens, E; Science and Technology for Disposal of Radioactive Tank Wastes In Press
(5) Cahill, R; Ph D Dissertation Texas A&M University 1996
(6) Keller, J; Proceedings of the First Hanford Separation Science Workshop (Report PNL-SA-21775) 1993, PI.35
(7) Lehto, J; J Chem Soc Dalton Trans 1989, V1, P101
(8) Lehto, J; J Radioanal Nucl Chem Lett 1987, V118, P1 CAPLUS
(9) Lehto, J; J Solid State Chem 1988, V73, P98
(10) Lehto, J; Radiochem Radioanal Lett 1981, V46, P381 CAPLUS
(11) Levi, B; Phys Today 1992, V45, P17
(12) Poojary, D; Chem Mater 1994, V6, P2364 CAPLUS
(13) Stark, J; Chemistry Data Handbook 1982, V2nd ed
(14) Sylvester, P; Sep Sci Technol 1999, V34, P1981 CAPLUS
(15) Sylvester, P; Unpublished Results
(16) Welcher, F; The Analytical Uses of Ethylenediamine Tetraacetic Acid 1958, P6
(17) Zorpette, G; Sci Am 1996, P88 CAPLUS

=>

L1 ANSWER 4 OF 12 CAPLUS COPYRIGHT 2003 ACS
AN 1999:500718 CAPLUS
DN 131:174295
TI Inorganic ion exchange materials for the removal of strontium from simulated Hanford tank wastes
AU Sylvester, Paul; Behrens, Elizabeth A.; Graziano, Gina M.; Clearfield, Abraham
CS Department of Chemistry, Texas A and M University, College Station, TX, 77842-3012, USA
SO Special Publication - Royal Society of Chemistry (1999), 239(Advances in Ion Exchange for Industry and Research), 288-297
CODEN: SROCDO; ISSN: 0260-6291
PB Royal Society of Chemistry
DT Journal
LA English
CC 60-3 (Waste Treatment and Disposal)
Section cross-reference(s): 8, 71
AB In the last 50 yr, large amts. of high level radioactive wastes have been produced at the Hanford nuclear site, Washington State, as a result of chem. extn. processes designed to sep. 239Pb from irradiated U fuel. These wastes, stored in steel-lined tanks, are believed to contain 3 distinct phases: a salt cake at the top of the tank; an alk. supernate; and a metal hydroxide-rich sludge at the bottom. In these wastes, Sr predominantly occurs in the sludges but is also entrained within the salt cake and alk. supernate. The synthesis and evaluation of a titanosilicate pharmacosiderite material, a **sodium nonatitanate**, and a sodium titanosilicate, were studied for their effectiveness in removing Sr from 2 simulated Hanford tank wastes using batch techniques and column studies. All materials were synthesized in highly basic conditions, making them stable in alk. tank wastes. **Sodium nonatitanate**, NaTi, and sodium titanosilicate, NaTS, were highly efficient at removing Sr from the simulated wastes, with >99.9% total Sr removed by both materials in batch expts. Column studies confirmed the high affinity of both sodium materials for Sr in the presence of high alky. and high inert salt concns., but column blockage proved problematic to salt pptn. within the columns and tubing. The potassium pharmacosiderite, did not perform as well as either NaTS or NaTi in any waste simulant; however, this material was more suitable to remove Sr and Cs from groundwater and other process wastes with lower total ionic strength.
ST strontium removal simulated Hanford tank waste; **sodium nonatitanate** sodium titanosilicate strontium removal; potassium pharmacosiderite removal strontium Hanford tank waste; ion exchange treatment simulated Hanford tank waste
IT Ion exchange
(batch and column study evaluation of ionic strength effect on inorg. ion exchange materials to remove strontium from simulated Hanford tank wastes)
IT Wastewater treatment
(ion exchange; batch and column study evaluation of ionic strength effect on inorg. ion exchange materials to remove strontium from simulated Hanford tank wastes)
IT Nuclear power
(wastes from; batch and column study evaluation of ionic strength effect on inorg. ion exchange materials to remove strontium from simulated Hanford tank wastes)
IT 159076-88-7P 176744-54-0P
RL: NUU (Other use, unclassified); PRP (Properties); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(batch and column study evaluation of ionic strength effect on inorg. ion exchange materials to remove strontium from simulated Hanford tank wastes)

IT 14158-27-1, Strontium-89, processes
RL: PEP (Physical, engineering or chemical process); POL (Pollutant); REM (Removal or disposal); OCCU (Occurrence); PROC (Process)
(batch and column study evaluation of ionic strength effect on inorg. ion exchange materials to remove strontium from simulated Hanford tank wastes)

IT 117314-20-2P
RL: NUU (Other use, unclassified); PRP (Properties); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(ion exchange material; batch and column study evaluation of ionic strength effect on inorg. ion exchange materials to remove strontium from simulated Hanford tank wastes)

RE.CNT 16 THERE ARE 16 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

(1) Amphlett, C; Inorganic Ion Exchangers 1964
(2) Anon; Personal Communication from M Johnson
(3) Behrens, E; Environ Sci Technol 1998, V32, P101 CAPLUS
(4) Behrens, E; PhD Thesis, Texas A&M University 1997
(5) Behrens, E; Science and Technology for Disposal of Radioactive Tank Wastes 1998
(6) Bortun, A; Solv Extr & Ion Exch 1996, V14, P341 CAPLUS
(7) Filina, L; Russ J Appl Chem 1995, V68, P665
(8) Graziano, G; MS Dissertation, Texas A&M University 1998
(9) Helfferich, F; Ion Exchange 1962
(10) Kullberg, L; Solv Extr & Ion Exch 1989, V7, P527 CAPLUS
(11) Lehto, J; J Radioanal Nucl Chem Letters 1987, V118, P1 CAPLUS
(12) Nenoff, T; Environ Sci Technol 1996, V30, P3630 CAPLUS
(13) Paulus, W; Nature 1992, V357, P571 CAPLUS
(14) Poojary, D; Chem Mater 1994, V6, P2364 CAPLUS
(15) Poojary, D; Inorg Chem 1996, V35, P6131 CAPLUS
(16) Sylvester, P; Solv Extr & Ion Exch 1998, V16(6), P1527 CAPLUS

=>

L1 ANSWER 5 OF 12 CAPLUS COPYRIGHT 2003 ACS
AN 1999:467297 CAPLUS
DN 131:162459
TI An assessment of inorganic ion-exchange materials for the removal of strontium from simulated Hanford tank wastes
AU Sylvester, Paul; Behrens, Elizabeth A.; Graziano, Gina M.; Clearfield, Abraham
CS Department of Chemistry, Texas A and M University, College Station, TX, 77842-3012, USA
SO Separation Science and Technology (1999), 34(10), 1981-1992
CODEN: SSTEDS; ISSN: 0149-6395
PB Marcel Dekker, Inc.
DT Journal
LA English
CC 71-11 (Nuclear Technology)
Section cross-reference(s): 68
AB Several inorg. ion-exchange materials were evaluated for the removal of strontium from two simulated Hanford tank wastes (NCAW and 101SY-Cs5) using static batch expts. Sodium titanium silicate, Na2Ti2O3SiO4.cntdot.2H2O (NaTS), was the best material in NCAW with a Kd of 2.7 .times. 105 mL/g at a vol.-to-mass ratio of 200:1. In the 101SY-Cs5 simulant, strontium extn. was more difficult due to the presence of complexants and consequently Kds were greatly reduced. **Sodium nonatitanate**, NaTi, performed best in the presence of these complexants and gave a Kd of 295 mL/g, though none of the materials performed particularly well. Pellets suitable for column studies were synthesized and the ion exchangers evaluated in column studies. Breakthrough curves correlated well with the Kds obtained from batch expts. with the sodium titanium silicate performing best in NCAW and a pelletized form of **sodium nonatitanate** performing best in 101SY-Cs5. Both the sodium titanate and the sodium titanosilicate performed better than IONSIV IE-911, a com. available ion exchanger, in the NCAW simulant, and consequently could be used for the removal of 90Sr from highly alk. tank wastes.
ST inorg exchanger strontium removal Hanford tank waste; radioactive waste strontium removal inorg exchanger; alk tank waste Hanford strontium removal inorg exchanger
IT Cation exchangers
Partition
Radioactive wastes
(assessment of inorg. exchanger for the removal of strontium from simulated highly alk. Hanford tank wastes)
IT 7440-24-6, Strontium, processes 14158-27-1, Strontium-89, processes
RL: PEP (Physical, engineering or chemical process); REM (Removal or disposal); PROC (Process)
(assessment of inorg. exchanger for the removal of strontium from simulated highly alk. Hanford tank wastes)
IT 117314-20-2 159076-88-7 176744-52-8 176744-54-0 197099-21-1, IONSIV IE-911
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(assessment of inorg. exchanger for the removal of strontium from simulated highly alk. Hanford tank wastes)
RE.CNT 20 THERE ARE 20 CITED REFERENCES AVAILABLE FOR THIS RECORD
RE
(1) Amphlett, C; Inorganic Ion Exchangers 1964
(2) Anon; Personal Communication from M Johnson
(3) Anthony, R; WO 94/19277 1994 CAPLUS
(4) Behrens, E; Chem Mater 1996, V8, P1236 CAPLUS
(5) Behrens, E; Chem Mater Submitted
(6) Behrens, E; Environ Sci Technol 1998, V32, P101 CAPLUS
(7) Behrens, E; PhD Thesis, Texas A&M University 1997

(8) Behrens, E; Science and Technology for Disposal of Radioactive Tank Wastes 1998, P287 CAPLUS
(9) Bortun, A; Solv Extr Ion Exch 1996, V14, P341 CAPLUS
(10) Clearfield, A; J Solid State Chem 1988, V73, P98 CAPLUS
(11) Filina, L; Russ J Appl Chem 1995, V68, P665
(12) Helfferich, F; Ion Exchange 1962
(13) Keller, J; First Hanford Separation Science Workshop 1993, PI.35
(14) Klavetter, E; Waste Management Symposia '94 (WM '94) 1994
(15) Kullberg, L; Solv Extr Ion Exch 1989, V7, P527 CAPLUS
(16) Lehto, J; J Radioanal Nucl Chem Lett 1987, V118, P1 CAPLUS
(17) Nenoff, T; Environ Sci Technol 1996, V30, P3630 CAPLUS
(18) Paulus, W; Nature 1992, V357, P571 CAPLUS
(19) Poojary, D; Chem Mater 1994, V6, P2364 CAPLUS
(20) Poojary, D; Inorg Chem 1996, V35, P6131 CAPLUS

=>

L1 ANSWER 6 OF 12 CAPLUS COPYRIGHT 2003 ACS
AN 1999:147030 CAPLUS
TI The removal of strontium from complexant-bearing hanford tank simulants
AU Sylvester, Paul; Clearfield, A.
CS Lynntech Inc., College Station, TX, 77840, USA
SO Book of Abstracts, 217th ACS National Meeting, Anaheim, Calif., March 21-25 (1999), I&EC-203 Publisher: American Chemical Society, Washington, D. C.
CODEN: 67GHA6
DT Conference; Meeting Abstract
LA English
AB The use of ion exchangers to remove strontium from simulated Hanford tank wastes contg. high concns. of complexants has proved to be inefficient. The strontium is strongly complexed, particularly by EDTA, and is not readily extd. from soln. Two Sr-selective ion materials, a **sodium nonatitanate** and a sodium titanosilicate, gave Sr distribution coeffs. (Kds) in tank 101-SY simulant of approx., 200 mL/g which corresponds to only about 50% Sr removal. One methodol. to improve the Sr Kds is the addn. of calcium to the simulant to sat. the complexants and thus make the Sr available for removal by ion exchange. Using this method, Sr Kds of up to 8000 mL/g were obtained for the sodium titanosilicate while the **sodium nonatitanate** showed very little improvement. An alternative method to remove strontium is to destroy the complexants using chem. oxidn. techniques followed by ion exchange.

=>

<=

L1 ANSWER 7 OF 12 CAPLUS COPYRIGHT 2003 ACS
AN 1999:4588 CAPLUS
DN 130:174269
TI Evaluation of a **sodium nonatitanate**, sodium titanosilicate, and pharmacosiderite-type ion exchangers for strontium removal from DOE waste and Hanford N-springs groundwater simulants
AU Behrens, Elizabeth A.; Sylvester, Paul; Graziano, Gina; Clearfield, Abraham
CS Department of Chemistry, Texas A and M University, College Station, TX, 77843, USA
SO Science and Technology for Disposal of Radioactive Tank Wastes, [Proceedings of the American Chemical Society Symposium on Science and Technology for Disposal of Radioactive Tank Wastes], Las Vegas, Nev., Sept. 7-11, 1997 (1998), Meeting Date 1997, 287-299. Editor(s): Schulz, Wallace W.; Lombardo, Nicholas J. Publisher: Plenum, New York, N. Y. CODEN: 67BHAF
DT Conference
LA English
CC 71-11 (Nuclear Technology)
Section cross-reference(s): 61, 68
AB Preliminary data suggest that the nonatitanate and the sodium titanosilicate are the best materials for Sr (Kd>200,000 and 269,500 mL/g, resp.) removal from the NCAW and DSSF-7 waste simulant. Several materials are suitable for Sr removal for groundwater remediation applications. The sodium titanosilicate produced the highest Sr Kd values in the N-springs simulant.
ST cation exchanger strontium removal; radioactive waste strontium removal cation exchanger; groundwater pollution strontium removal cation exchanger
IT Cation exchangers
Groundwater pollution
Partition
Radioactive wastes
(ion exchanger evaluation for strontium removal from DOE waste and Hanford N-springs groundwater simulants)
IT Chabazite-type zeolites
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(ion exchanger evaluation for strontium removal from DOE waste and Hanford N-springs groundwater simulants)
IT Pelletization
(ion exchanger evaluation for strontium removal from DOE waste and Hanford N-springs groundwater simulants in relation to)
IT 7440-24-6, Strontium, processes 14158-27-1, Strontium-89, processes
RL: PEP (Physical, engineering or chemical process); REM (Removal or disposal); PROC (Process)
(ion exchanger evaluation for strontium removal from DOE waste and Hanford N-springs groundwater simulants)
IT 12173-10-3, Clinoptilolite 117314-20-2 159076-84-3
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(ion exchanger evaluation for strontium removal from DOE waste and Hanford N-springs groundwater simulants)
IT 176744-54-0
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(pharmacosiderite-phase; ion exchanger evaluation for strontium removal from DOE waste and Hanford N-springs groundwater simulants)
RE.CNT 18 THERE ARE 18 CITED REFERENCES AVAILABLE FOR THIS RECORD
RE
(1) Bidear, J; J Non-Cryst Solids 1982, V48, P385
(2) Brow, R; Phys Chem Glass 1991, V32(5), P188 CAPLUS
(3) Bunker, B; Sludge compositions

(4) Cunnane, J; Mat Res Soc Proc 1993, V294, P225 CAPLUS
(5) Day, D; Final Technical Report for Contract No 276822-A-F1 1995
(6) Day, D; Final Technical Report for Contract No AF-0923 1994
(7) Ijjaali, M; Eur J Solid State Inorg Chem 1991, V28, P983 CAPLUS
(8) Illman, D; Chem&Eng 1993, P9
(9) Materials Characterization Center; Nuclear Materials Handbook 1982, DOE/TIC-11400
(10) Matzke, H; J Nuc Mat 1993, V201, P295 CAPLUS
(11) Mellinger, G; US DOE Report PNL-4955-2 1984
(12) Mesko, M; Masters Thesis University of Missouri-Rolla 1993
(13) Peng, Y; Glass Tech 1991, V32(5), P166 CAPLUS
(14) Sales, B; Mat Letters 1984, V2(4B), P301 CAPLUS
(15) Sales, B; Science 1984, V226(4607), P45
(16) Tooley, F; The Handbook of Glass Manufacture Volume 1 Books for Industry 1974
(17) Yanagi, T; J Nuc Sci And Tech 1988, V25(8), P661 CAPLUS
(18) Yu, X; to be published in J Non-Cryst Solids

=>

L1 ANSWER 8 OF 12 CAPLUS COPYRIGHT 2003 ACS
AN 1997:757609 CAPLUS
DN 127:350546
TI Assessment of a **Sodium Nonatitanate** and Pharmacosiderite-Type Ion Exchanger for Strontium and Cesium Removal from DOE Waste Simulants
AU Behrens, Elizabeth A.; Sylvester, Paul; Clearfield, Abraham
CS Department of Chemistry, Texas AM University, College Station, TX, 77843, USA
SO Environmental Science and Technology (1998), 32(1), 101-107
CODEN: ESTHAG; ISSN: 0013-936X
PB American Chemical Society
DT Journal
LA English
CC 60-2 (Waste Treatment and Disposal)
Section cross-reference(s): 71
AB Several inorg. ion exchangers were tested for 89Sr and 137Cs removal from simulated DOE aq. defense wastes (NCAW and 101SY-Cs5) and a Hanford groundwater soln. (N-springs). The materials used in this study consisted of the 3-dimensional tunnel-structured pharmacosiderites [M3H(AO)4(BO4)3.cntdot.4-6H2O (M = H, K; A = Ti, Ge; B = Si, Ge); the layered Na nonatitanate, Na4Ti9O20.cntdot.xH2O; and 2 com. available exchangers, AW-500 and clinoptilolite]. 89Sr and 137Cs distribution coeff. (Kd) measurements showed that all of the synthetic exchangers removed .gtoreq.97% of the 89Sr from the N-springs groundwater simulant in a single static equilibration. This simulant also contained ppm levels of Ca2+, Mg2+, K+, and Na+. Similarly, many of the same materials efficiently removed 137Cs (>98%) from the same soln., except for Na titanate, which exhibited the lowest Kd of 1210 mL/g for Cs+. These preliminary Kd values provide an indication that these exchangers may act as dual Cs+ and Sr2+ sorbers for groundwater remediation applications. The different phases were also tested as potential exchangers for 137Cs and 89Sr in different nuclear waste simulants. While none of the materials showed little preference for 137Cs in highly basic solns. contg. large concns. of NaNO3, a K titanosilicate and the Na titanate yielded 89Sr Kd values of 20 180 mL/g (DF = 91) and 235 120 mL/g (DF = 1177), resp.
ST **sodium nonatitanate** strontium cesium wastewater groundwater; pharmacosiderite strontium cesium wastewater groundwater; ion exchanger strontium cesium wastewater groundwater
IT Wastewater treatment
Water purification
(ion exchange; **sodium nonatitanate** and pharmacosiderite-type ion exchanger for strontium and cesium removal from wastewater and groundwater)
IT Radioactive wastes
(**sodium nonatitanate** and pharmacosiderite-type ion exchanger for strontium and cesium removal from wastewater and groundwater)
IT Chabazite-type zeolites
RL: NUU (Other use, unclassified); USES (Uses)
(**sodium nonatitanate** and pharmacosiderite-type ion exchanger for strontium and cesium removal from wastewater and groundwater)
IT 12173-10-3, Clinoptilolite 12256-07-4, Pharmacosiderite 61026-54-8, Chabazite 117314-20-2
RL: NUU (Other use, unclassified); USES (Uses)
(**sodium nonatitanate** and pharmacosiderite-type ion exchanger for strontium and cesium removal from wastewater and groundwater)
IT 7440-24-6, Strontium, processes 7440-46-2, Cesium, processes 10045-97-3, Cesium-137, processes 14158-27-1, Strontium-89, processes

RL: REM (Removal or disposal); PROC (Process)
(**sodium nonatitanate** and pharmacosiderite-type ion exchanger for strontium and cesium removal from wastewater and groundwater)

=>

L1 ANSWER 9 OF 12 CAPLUS
AN 1997:612668 CAPLUS
DN 127:312297
TI Comparison of organic and inorganic ion exchangers for the batch contact removal of cesium and strontium from simulated and actual Hanford 241-AW-101 DSSF tank waste
AU Brown, G. N.; Bray, L. A.; Carlson, C. D.; Carson, K. J.; DesChane, J. R.; Elovich, R. J.; Hoopes, F. V.; Kurath, D. E.; Nenninger, L. L.; Tanaka, P. K.
CS Pacific Northwest Natl. Lab., Richland, WA, 99352, USA
SO Proceedings of the International Topical Meeting on Nuclear and Hazardous Waste Management, SPECTRUM '96, 6th, Seattle, Aug. 18-23, 1996 (1996), Volume 3, 2293-2299 Publisher: American Nuclear Society, La Grange Park, Ill.
CODEN: 65AVA4
DT Conference
LA English
CC 71-11 (Nuclear Technology)
AB This report describes the evaluation of seven ion exchange materials (sodium nonatitanate (NaTi), CS-100, resorcinol-formaldehyde (R-F), SuperLig.RTM. 644, IONSIV.RTM. IE-910, IE-911, and TIE-96) for pretreatment of actual and simulated Hanford tank waste. The data can be applied to the development and evaluation of pretreatment process flowsheets. Cs and Sr batch distributions ratios (Kd), column distribution ratios (.lambda. = Kd x .rho.b), and decontamination factors (DF) are compared as a function of supernate:exchanger phase ratio, soln. compn., and multiple sequential contacts. The actual double shell slurry feed (DSSF) waste used was a vol. composite from tanks 101-AW (70%), 106-AP (20%) and 102-AP (10%) dild. to 4.96 .+-. 0.19 M sodium with an initial Na/Cs ratio of 78,000. Simulant test were conducted at waste dilns. ranging from 7 to 0.2 M Na, over a wide range of Na/Cs mole ratios (50 to 500,000).
ST org exchanger radionuclide removal Hanford waste; inorg exchanger radionuclide removal Hanford waste; cesium removal ion exchanger Hanford waste; strontium removal ion exchanger Hanford waste; radioactive waste removal inorg org exchanger
IT Phenolic resins, uses
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(CS 100; comparison of org. and inorg. ion exchangers for removal of cesium and strontium from simulated and actual Hanford tank waste)
IT Radioactive wastes
(comparison of org. and inorg. ion exchangers for removal of cesium and strontium from simulated and actual Hanford tank waste)
IT Sludges
Sludges
(radioactive; comparison of org. and inorg. ion exchangers for removal of cesium and strontium from simulated and actual Hanford tank waste)
IT Radioactive wastes
Radioactive wastes
(sludges; comparison of org. and inorg. ion exchangers for removal of cesium and strontium from simulated and actual Hanford tank waste)
IT 9003-35-4
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(CS 100; comparison of org. and inorg. ion exchangers for removal of cesium and strontium from simulated and actual Hanford tank waste)
IT 7440-70-2, Calcium, processes
RL: REM (Removal or disposal); PROC (Process)
(comparison of org. and inorg. ion exchangers for removal metals from simulated and actual Hanford tank waste)
IT 7440-24-6, Strontium, processes 7440-46-2, Cesium, processes

10045-97-3, Cesium 137, processes   10098-97-2, Strontium 90, processes
RL: POL (Pollutant); REM (Removal or disposal); OCCU (Occurrence); PROC (Process)
(comparison of org. and inorg. ion exchangers for removal of cesium and strontium from simulated and actual Hanford tank waste)

IT 24969-11-7, Resorcinol-formaldehyde copolymer   111591-44-7, Sodium titanate (Na4Ti9O20)   181186-61-8, Ionsiv IE 910   181186-86-7, Ionsiv TIE 96   197099-21-1, Ionsiv IE 911   197394-24-4, SuperLig 644
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(comparison of org. and inorg. ion exchangers for removal of cesium and strontium from simulated and actual Hanford tank waste)

IT 7439-89-6, Iron, processes   7440-02-0, Nickel, processes   7440-41-7, Beryllium, processes   7440-47-3, Chromium, processes   7440-67-7, Zirconium, processes
RL: REM (Removal or disposal); PROC (Process)
(comparison of org. and inorg. ion exchangers for removal of metals from simulated and actual Hanford tank waste)

=>